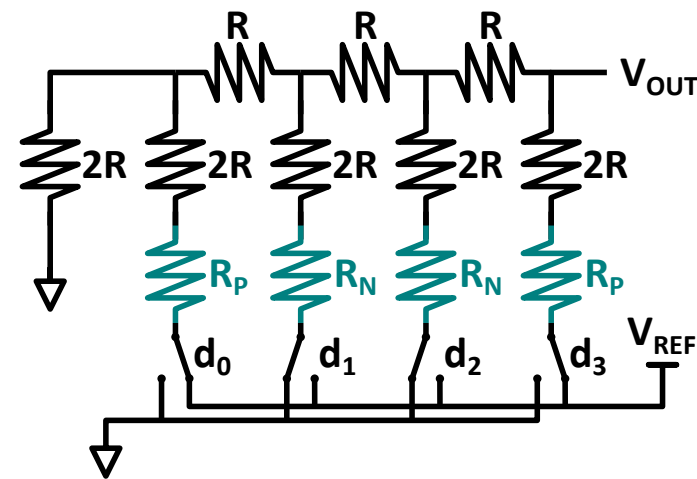
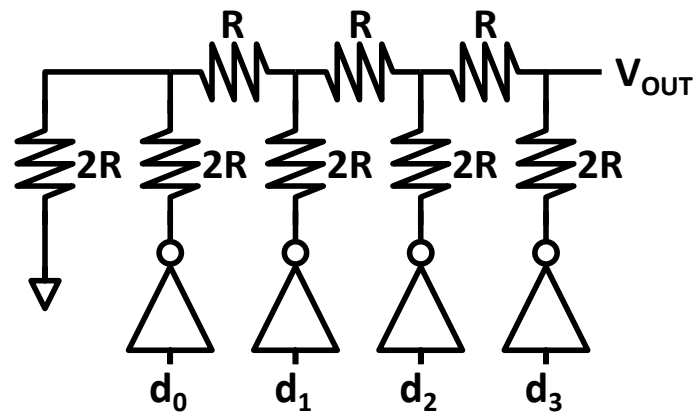
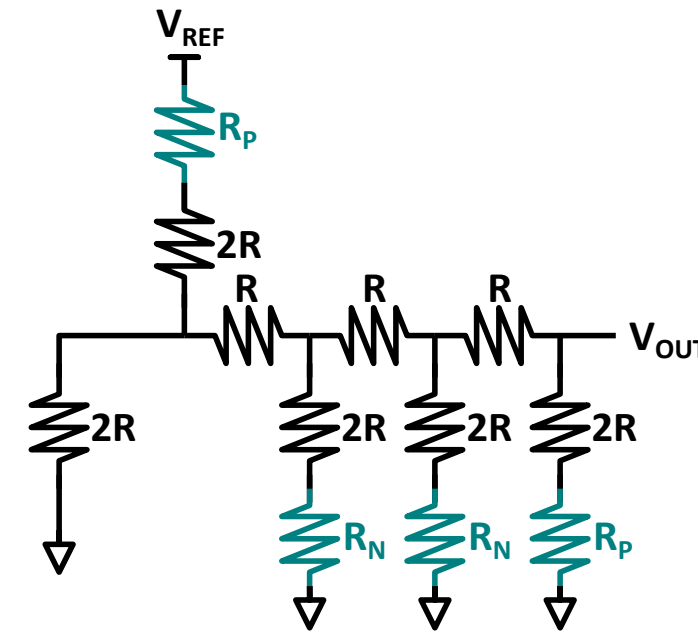


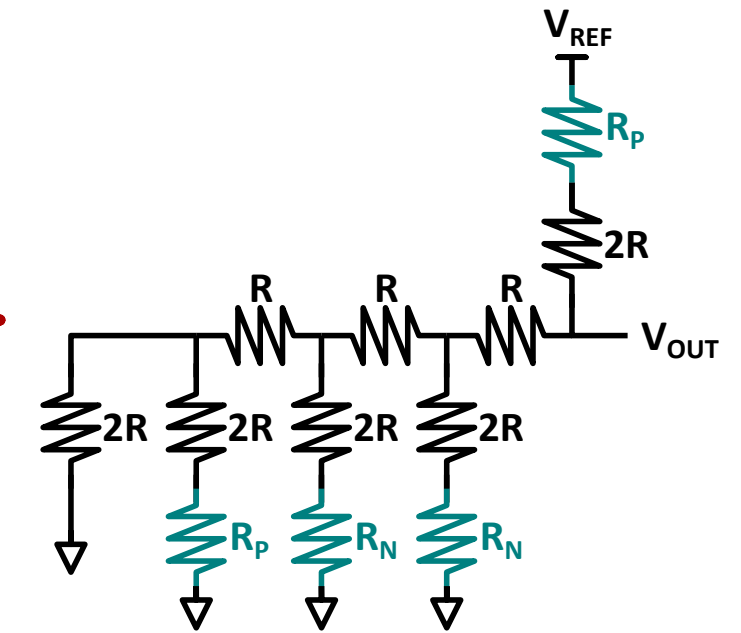
R2R-ladder DAC



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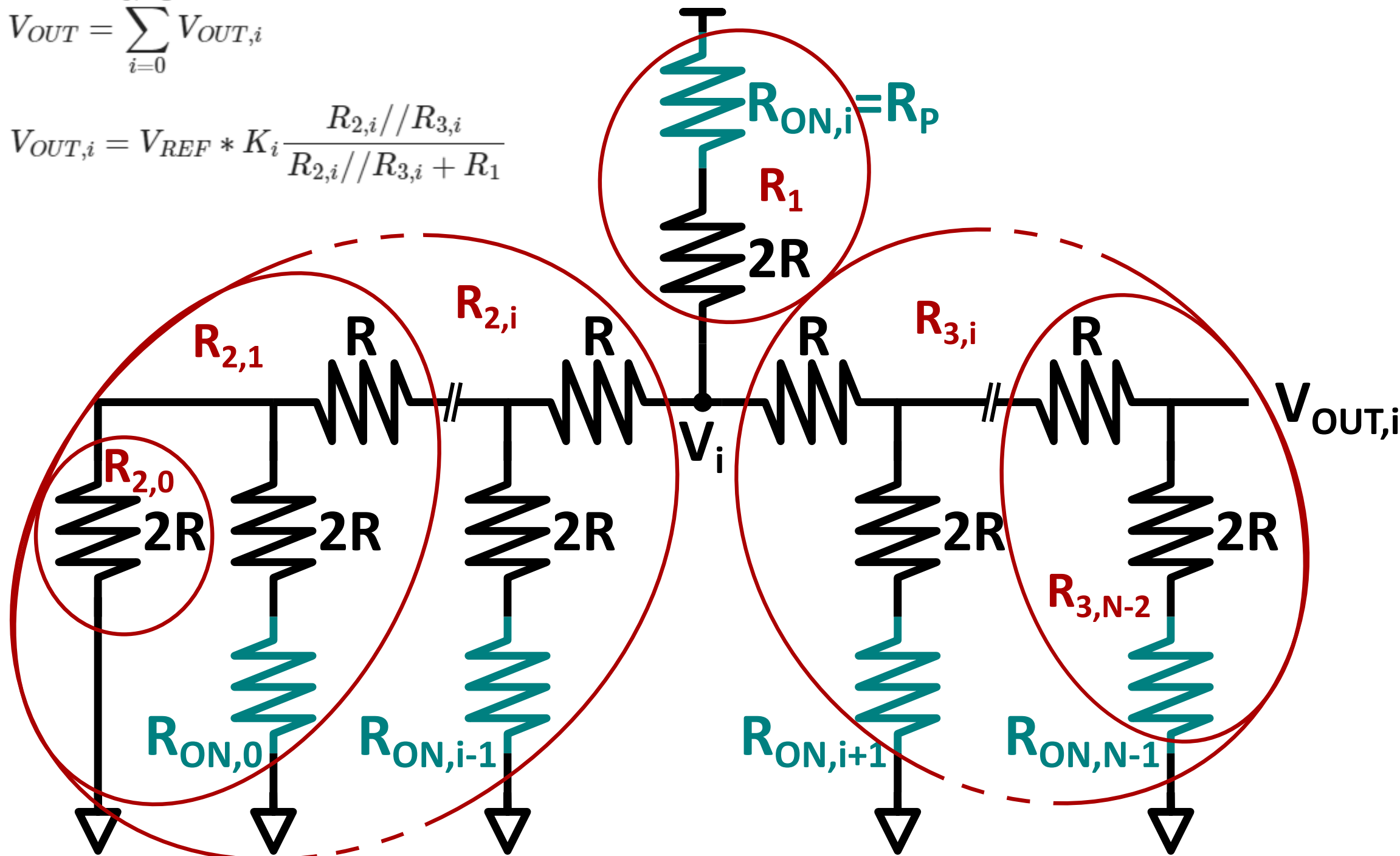


$+$



$$V_{OUT} = \sum_{i=0}^{N-1} V_{OUT,i}$$

$$V_{OUT,i} = V_{REF} * K_i \frac{R_{2,i} // R_{3,i}}{R_{2,i} // R_{3,i} + R_1}$$



$$R_1 = 2R + R_P$$

$$\begin{cases} R_{2,0} = 2R \\ R_{2,i} = R + (2R + R_{ON,i-1}) // R_{2,i-1} \end{cases}$$

$$\begin{cases} R_{3,N-1} = \text{inf} \\ R_{3,N-2} = 3R + R_{ON,N-1} \\ R_{3,i-1} = R + (2R + R_{ON,i}) // R_{3,i} \end{cases}$$

$$\begin{cases} K_{N-1} = 1 \\ K_{N-2} = \frac{2R + R_{ON,i}}{3R + R_{ON}} \\ K_{i-1} = K_i \frac{(2R + R_{ON,i}) // R_{3,i}}{(2R + R_{ON,i}) // R_{3,i} + R} \end{cases}$$

$$R_{ON,i} = \begin{cases} R_P, & \text{if } (\text{code}/2^i) \% 2 == 1 \\ R_N, & \text{else} \end{cases}$$

$$R_{Th} = (2R + R_{ON,N-1}) // R_{2,N-1}$$